

XI. *Notes on the genus Erebia.* By HENRY J. ELWES,
F.L.S., F.Z.S., &c.

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WITH the object of making the butterflies of the palæ-arctic fauna better known to English entomologists, I have in recent years reviewed the genera *Colibas* and *Parnassius*, and I now propose to make some remarks on the genus *Erebia*, which is, on account of its tendency to great variation and remarkable distribution, a most interesting and at the same time difficult genus.

Though our knowledge of many of the Arctic and Asiatic species is still too slight to make a monograph of the genus possible, yet so many additions have been made to the *Erebias* in the last ten or twelve years, by Russian collectors especially, that a large number of species are not included in Staudinger's Catalogue of 1870. Another reason for revising this genus is that a paper on it, by Herr von Gumpfenberg, has appeared in the last number of the 'Stettiner Entomologische Zeitung,' which does not seem to be founded on a good knowledge of any but the European species; and as this arrangement of the genus is, in my opinion, not so natural as that of Staudinger, it should not be allowed to pass without criticism. At the same time I wish to show that some of the varieties which are defined by short Latin descriptions, both by Von Gumpfenberg and Staudinger, cannot, in my opinion, be so defined as to include many specimens which occur.

It very frequently happens both in this and other genera that a number of variations exist which are not constant, and though it is sometimes possible to limit and define them in words, yet more often the attempt to make such a key to the genus as has been attempted by Von Gumpfenberg, proves a failure when applied to a large number of specimens.

Though keys have been of late years very much in fashion among ornithologists, and are now being adopted

by some systematic lepidopterists, yet I cannot say that I have found them satisfactory as a means of discriminating species of butterflies. It seems to me that, though they answer very well when applied to typical specimens, yet there are so many specimens in a large and well-selected collection which vary in some character or other, that even the short diagnoses which have been used for named varieties in Staudinger's Catalogue will not always apply; and, as far as my experience goes, we are reduced at last to rely upon a more or less indefinite opinion, based on examination of a large number of specimens, and upon our knowledge of the extent of variation found in other species of the genus. It is supposed by some that we may eventually arrive at a more accurate systematic arrangement, by a knowledge of the preparatory stages and the life-history of a species; or again, by an anatomical examination of the sexual organs, scales of the wings, or other parts. But though it is not so easy to observe variation in characters which require such minute examination as these, yet I do not doubt that variation exists; and though in the genus *Parnassius* I have found anatomical characters of the greatest assistance; in *Erebia* I have at present not been able to do so.

There is no doubt that the systematic arrangement of Staudinger's Catalogue, which I look upon as one of the most accurate and careful works ever produced, based as it is on his unrivalled knowledge of species, is incomparably better than the one adopted in the British Museum, where the idea seems to have been,—in the genus *Erebia* at least,—to find a specimen to match, or which is assumed to match, almost every name or description ever published, quite overlooking the fact that the authors of many of these names and descriptions were at the time very imperfectly acquainted with either the forms they were attempting to discriminate, or with their allies. And I think it is most detrimental to the value of such a Museum, which should be of use to all students who wish to have their own collections in good order, that the peculiar views which Mr. Butler holds in opposition to those of almost all other lepidopterists, should be developed to such a pernicious extent in the arrangement of this and many other genera.

It is true that when he published his Catalogue of

Satyridæ in the British Museum, in 1868, that collection was so poor in European species that there was some excuse for the numerous incorrect or doubtful identifications and omissions which are found in it, though a very little care would have avoided the still more numerous incorrect localities given for many well-known species. But when a few years ago the rich and correctly-named collection of Zeller was acquired by the Museum, a good opportunity was afforded of correcting these mistakes, and of rearranging the genus in a manner which would make it of great service to the number of English entomologists who had previously no good collection of European Lepidoptera available for reference.

And, if Mr. Butler had not been satisfied with, or had disagreed with Zeller's ideas, which, however, were based on a much greater personal knowledge of this fauna than his own, it might have been expected that he would have taken some pains to study the latest opinions of the best authorities before rearranging the Collection. It appears, however, that so far from this, he has not even taken the trouble to write new labels, but has, as far as possible, endeavoured to make the new specimens fit in with the old names, and has in some cases separated the correctly-named specimens of Zeller, and placed them under several different so-called species; whilst in others he has united several perfectly well-known and distinct species under one head, distinguishing them as "local form" or "var.," without apparently the least idea as to what their local or general distribution is.

I am quite ready to admit the difficulty of correctly identifying many of the figures of Esper, Hübner, and others, and also of ascertaining with certainty the exact dates of publication of these plates, by which alone their priority can be determined. It really matters little or nothing now whether, for instance, *melas* of Herbst has two years' priority over *maurus* of Esper, as Staudinger thinks, or whether, as Butler believes, *maurus* has nineteen years' priority over *melas*. As, however, Esper distinctly states that his *maurus* came from Hungary, I fail to see why Butler should give its locality as "Pyrenees," or why he should mix up with it such perfectly distinct and well-known species as *nerine*, Frey., *stygne*, Ochs., *alecto*, Hübner. (so marked by Zeller, a variety of *glacialis*, Esp.), and *scipio*, Boisduval.

excepting that they were so mixed up in the Catalogue and Collection in 1868.

When all these questions of priority and identification have been, it is hoped, for ever set at rest by the almost universal acceptance of the nomenclature of Staudinger's Catalogue, which, if not in all cases certainly correct, is a most praiseworthy and careful attempt to settle these difficult questions, I fail to see how Mr. Butler can expect his nomenclature of *Erebias*, which, on the other hand, has from the first been almost absolutely ignored, to be now accepted. And if he does not expect this, what can be the use of turning order into chaos, as he has done here?

As an additional proof of his peculiar ideas, I will give one instance only, that of *E. lappona*, Esp. This is a species about which there can be no question. It varies wherever it is found, but none of the varieties are known to be constant, or peculiar to one place, and therefore I think none are deserving of even varietal names. In the British Museum they are arranged as follows:—

E. manto, Denis.

E. castor, Esp.

E. castor, var.

E. lappona, Esp. (In the Catalogue this is treated as a synonym of *manto*.)

E. pollux, Esp.

E. mantoides, Butl. (Merely a Lapland specimen of *lappona*, which can be exactly matched in the Alps.)

E. sthenno, Grasl. (Merely an inconstant var. from the Pyrenees.)

Thus making five species and two varieties out of one, whilst he had just before united five species into one. The result is that, so far as I have had occasion to consult it, the value of Zeller's Collection is for the time seriously impaired, and it would be better for Science that it should not have come to the British Museum in Mr. Butler's time, than that it should be the means of confusing and misleading those who might wish to obtain correct information on a subject which has hitherto been too little studied by British entomologists.

It will be unnecessary for me to go in detail through

the Catalogue of Erebias in the British Museum, but I may say generally that it appears to illustrate a general desire to find specimens to fit names rather than to apply names to species; and in several instances where Standinger and others have named varieties with more or less justice as varieties only, Butler has adopted the name as specific without indicating that the author of the name did not so consider it. This, of course, is a matter of opinion only, which is not of vital importance, but it is as well that a name given by an author should not be adopted in a different sense to that intended by him, or one may be led to suppose that such names as *sudetica*, Stgr., *pyrrhula*, Frey., *polaris*, Stgr., *uralensis*, Stgr., were used specifically by their authors, when it is really Mr. Butler who has so applied them.

In classifying the species of *Erebia* I am unable to follow Von Gumpfenberg, who divides the genus into groups by the under side of the hind wing, especially in the female sex. The colour and banding of this wing is no doubt of much more value in determining the species than the colour or form of the bands or ocelli on the upper side, but it leads to the grouping of species which are otherwise but little related.

I think that the number of ocelli is of little account as a specific character, for in almost all species we find great variation in the number and size, but rarely in the position of the ocelli. The colour of the disk of the fore wing, especially on the under side, seems to be a more constant and useful character than any other, and often enables one to identify species when other characters vary.

There are no doubt some more or less natural groups within the genus, which I have tried to indicate by the sequence of the species; but none of them, I think, are as yet shown to be capable of such exact definition as would allow the formation of subgenera.

Butler has adopted as a separate genus *Oreina* of Westwood, including in it such little-allied species as *theano*, *melampus*, *glacialis*, and others, though I can see no reason for so doing. He also uses the generic name *Maniola*, Schrank. (which by Kirby is adopted for the whole of what I call *Erebia*), for some species which seem to have little affinity for each other, and, as far as I know, without indicating what he considers typical of

Maniola. These are *epistygne*, Hüb., *afes*, Esp., from which he separates both *phegia* and *dalmata*, *parmenio*, and *oenus*, whilst *kalmuka* at the end of the series is not assigned to any genus.

I am unable to find any exact limit between *Erebia* and the genus *Callerebia* of Butler, which appear to be connected by some of the Himalayan and Mongolian forms, yet the typical Callerebias are easily separable by their larger size, differently-shaped hind wings, and different style of marking on the under side.

My own collection, though not so complete as I could wish, includes specimens of all the known species, except *E. sofia*, Streck., *E. tundra*, Stgr., *E. dabanensis*, Ersch., *E. ero*, Men., *E. patagonica*, Mab.: all of which are only known from single or very few specimens in the collections of their describers. As I have had the advantage of examining the very fine series in the collections of Dr. Staudinger, M. Oberthür, and Messrs. Godman, Leech, and Strecker, I do not think I have overlooked any undescribed forms of importance. The distribution of the genus, as here accepted, is confined to the Palearctic region, in which I must include all those parts of North America in which Erebias occur; and it is a curious fact that though they are present in almost every other part of the region except North Africa, there are none in the United States east of the Rocky Mountains.

There seem to be two principal centres of distribution. First and most important, the Alps of Central Europe, which have about 25 species, or if *eriphyle* and *curyale* are not considered good species, 23, of which 6, namely, *arete*, *pharte*, *mnestra*, *scipio*, *goante*, and *glacialis* are confined to this group of mountains, though *arete* is only found in their extreme eastern, and *scipio* in their extreme south-western district. In the Pyrenees we have 12 species, of which all are found in the Alps except *melas*; and there are two others, namely, *epistygne*, which is found in the lower mountains of Southern France, and *zapateri*, confined to Eastern Spain, which do not occur either in the Alps or Pyrenees.

In all, therefore, 27 species are found in Central and South-western Europe, only 2 of which extend to Great Britain, and 3 to Arctic Europe. Of the alpine species, 2 only extend to the higher mountains of Central Europe,

namely, *melampus*, which occurs in Silesia, and *epiphron* in Silesia and the Hartz Mountains; whilst 3 others, namely, *medusa*, *æthiops*, and *ligea*, are found not only in the plains and lower hills of Central Germany, but extend far east into Siberia and Amurland, where they are the only European non-arctic species which occur.

In South-eastern Europe and the Balkan Peninsula we find no peculiar species except *afra* and *melas*, the former a lowland or steppe, the latter a high-mountain insect; both of them extend into Western Asia.

In the Caucasus we have no peculiar species at all, and none of the Siberian or Turkestan species occur. This is very remarkable when we consider the great elevation, extent, and isolation of the Caucasian Mountains, which would seem to be admirably adapted to the habits of the genus. Either there is some geological or other condition which has prevented the development of high alpine species in the Caucasus, or else the higher parts of the range have been greatly neglected by entomologists, for in the Grand Duke Romanoff's Catalogue of the Butterflies of the Caucasus I find an almost total absence of alpine butterflies peculiar to the range, *Parnassius nordmanni* and *Satyrus alpina* being perhaps the only exceptions; whilst the high mountain species of Central Europe are only represented by three or four, namely, *Pieris callidice*, *Argynnis pales*, *Erebia tyndarus*, and a form of *Lycæna orbitulus*. As none of the alpine forms found in Turkestan or the Himalayas extend so far west, we have what seems to be a unique instance of a great chain of high mountains almost devoid of true alpine Lepidoptera. I see no means of accounting for this but the extreme isolation of the range, which is bounded on the east and west by sea, and on the north by a steppe of more or less desert character and immense extent.

In the whole of Europe, therefore, including arctic species, we have 29 species of *Erebia*,—about half the genus,—of which only about 6, namely, *medusa*, ? *melampus*, *tyndarus*, *lappona*, *æthiops*, and *ligea*, extend to Siberia, and one, *E. afra*, to Turkestan.

In Turkestan and the Altai regions, but with two or three exceptions confined to the mountain ranges, we have another quite distinct group of species, about 14 in number, of which only *tyndarus* is found in Europe, and none apparently in Eastern Siberia, the remainder being, as far as we know, peculiar to the region.

In Amurland and Northern Siberia we have 10 or 12 species, of which 3 or 4 are of arctic character; *parmenio* extends to Central Siberia, *cyclopius* west to the Ural, and one is found in Japan. None except *tristis*, *dabanensis*, *ero*, and *edda* are peculiar.

In Arctic America we have 4, or perhaps 5, of which *sofia* and *fasciata* are peculiar; and *discoidalis* extends to Eastern and Northern Asia.

Lastly, in the Rocky Mountains we have 4, of which *magdalena* and *epipsodea* are peculiar; while *tyndarus* extends to Europe and Asia; and *Disa*, as yet found only in the north, is a circumpolar species.

SYNOPSIS OF THE GENUS EREBIA.*

1. EPIPHRON, *Knoch.*, *Beit.*, iii., 131, t. 6 (1783); *Hartz*; *Siles.*; *Blk.*
H.-S., 92—4. *Forest*; *Vosges.*
var. *pyrenaica*, H.-S., 535—8 (inconstans, *Pyr. or.*
nomen vix conservandum, transitus
ad *cassiopem* in partem.
var. *cassiopæ*, *Fab.*, *Mant.*, 42 (1787); Meyer-*Alps*; *Pyr.*; *Hung.*
Dür, ii., figs. 4, 5, 7, (inconstans, *mont.*; *Scot.*
formæ intermediæ adsunt).
ab. *nelampus*, *Boisd.*, *Gen.*, p. 26 (1840);
Meyer-Dür, ii., fig. 3, (ab. vix fasciata
et fere inocellata).
? var. *kefersteini*, *Ev.*, *Bull. Mosc.*, 1851, ii, *Sib. cent. mont.*
610; H.-S., 617—18 (forma dubia
mili natura ignota).
2. TUNDRA, *Stgr.*, *Rom. Mem.*, iii., p. 148, t. *Irkutsk.*
viii., 1 (1888).
3. MELAMPUS, *Fuessl.*, *Verz. Schw. Ins.*, p. 31, *Alp.*; *Hung. alp.*
fig. 6 (1775); *Esp.*, 103, 1.
var. *sudetica*, *Stgr. Cat.*, p. 10 (1861), (var. *Silesia mont.*; *Alp.*
mac. ruf. majoribus, nomen vix con-
servandum).
4. ERIPHYLE, *Frey.*, ii., p. 150, t. 187, 3, 4 (1836); *Helv.*; *Styr.*; *Aust.*
Meyer-Dür, p. 154, t. ii. 8; cf. *Roth.*, *inf.*; *Carn.*; *Car.*
Mitt. Schw. Ent. Ges., i., p. 110 (1863); *mont. et alp.*
Christ, l.c., vi., p. 231 (1882): (sp. dubia
an *melampus* var., an *melampus* et
pharte hybrida.)

* In this Synopsis I have, to save space, in many cases used the same abbreviations as are used in Standinger's 'Catalogue'; but I have omitted the greater part of the synonyms and references given by him as no longer necessary.

5. ARETE, *Fab.*, *Mant.*, 42 (1787); *Hüb.*, 231—2. *Car. alp.*
6. MNESTRA, *Hüb.*, 540—3 (1802); *Esp.*, 120, 3, *Alp.*; *Gal. alp.*
4 (post 1802?).
7. MAURISIUS, *Esp.*, 113, 4, 5; *Forts.*, p. 106 *Sib. cent.*; *Altai*
(1802?).
? pawlowskyi, *Men.*, *Bull. Phys. Math.*, xvii.,
p. 217; *En.* iii., p. 145.
? var. haberhaueri, *Stgr.*, *S. E. Z.*, 1881, *Tarbagatai*; *Ala-*
p. 268 (minus distincte notata, *? in-*
constans).
8. KINDERMANNI, *Stgr.*, *S. E. Z.*, 1881, p. 269 *Altai mont.*
(*? bona sp. an maurisii var.*).
9. SOFIA, *Streck.*, *Bull. Brook. Ent. Soc.*, *Fort Churchill*
1881, p. 35 (mihi natura ignota, *maurisio*
proxima fide Strecker).
10. THEANO, *Tausch.*, *Mem. Mosc.*, i., p. 207, *Sib. cent.*; *Altai*;
t. 13, 1 (1809).
stubbendorfi, *Men.*, *Bull. Acad. Petr.*, v.,
p. 262 (1847). *? Amur sup.*
11. TURANICA, *Ersch.*, *Hor. Ent. Ross.*, vol. *Alatau, Namagan,*
xii., 1876, p. 336; *Alph.*, *l. c.*, p. 80 (in
separata), t. xv., fig. 22. *Thian-shan*, 3000
var. leta, *Stgr.*, *S. E. Z.*, 1881, p. 275
(*punctis paucioribus*; *nomen vix*
conservandum). —10,000 *ped. alt.*
12. PHARTE, *Hüb.*, 491—4 (1802?). *Alp. Tyrol*; *Styr.*
13. MANTO,* *Esp.*, 70, 2, 3 (1781), ii., p. 106, *Alp.*; *Pyr.*; *Hung.*
120, 1. *alp.*
pyrrha, *Fab.*, *Mant.*, 42 (1787); *Hüb.*,
235—6.

* The synonymy of *E. manto*, *Esp.*, and *E. lappona*, *Esp.*, are disputed points, and require some explanation, but I have followed Staudinger, whose views, I think, are correct. He says that Schiffermuller's names, having no means of identification by descriptions or figures, do not give priority. Therefore, as Esper's plate of *manto* (1781) is unmistakable, it has priority over *pyrrha* of Fabricius, *Mant.*, 42 (1787); whilst *pyrrha* of Fabricius, *Syst. Ent.* (1775), though older, is a different species. *Manto* being thus preoccupied in 1781, the name cannot be used for another species (No. 27 in my synopsis) by Fabricius and Hübner, and gives place to *lappona*, *Esp.*, t. 108, 3 (1798?). Esper had previously named varieties of the same species *Castor* and *Pollux*, t. 67, 2, 3 (1781), but these names had also been pre-occupied for other butterflies by Fabricius in 1777.

- var. *vogesiaca*, Christ, Mitt. Schw. Ent. Ges., vi. (1882), p. 9 in separata (inconstans, nomen haud conservandum.) *Vosges mont.*, 3500—4000 *ped.*
- var. *cæcilia*, Hüb., 213—14; Text, p. 35; H.-S., 584—5, var. supra fere vel tota nigra infra vix vel infasciata; (trans. ad ceme?). *Alp.*; *Pyr.*
- var. *pyrrhula*, Frey, Lep. Schw., p. 37 (1880). (var. minor, alpestris; an bona species?). *Graubunden*, 7—8000 *ped.*
14. CETO, Hüb., 578—9 (1803). *Alp.*; *Hung. alp.*; *Gal. alp.*
- var. vel ab ? *phorcys*, Freyer, 193, 2, iii., p. 4 (nomen vix conservandum).
15. CEME, Hüb., 530—33 (1803); Esp., 120, 2 (post 1803). *Alp.*; *Gal. mont.*; *Pyr.*
- var. *spodia*, Stgr. Cat. 1871, p. 24, *psodea*, Freyer, 121, 3, ii., p. 44; H.-S., 165—7 (forma major, ocellis majoribus, transitus ad *hippomedusam*). *Austr. et Styr. alp. et mont.*
16. MEDUSA, Fabr., Mant., p. 40 (1787); Hüb., t. 45, 103—4. *Germ. cent. et mer.*; *Belg.*; *Gal. or.*; *Helv. ad 4000 ped.*
- var. *hippomedusa* (Ochs., Meiss. N. Anz. Schw., n. 12, p. 15, *fide* Meyer-Dür) (var. alpestris inconstans, transitus ad *spodiam*). *Aust. Styr. et Helv. mont. et alp.* (3700—6000 *ped.* *fide* Meyer-Dür).
- var. *psodea*, Hüb., 497—9; Text, p. 34. (var. inconstans ocellis pluribus majoribus). *Hung. or.*; *Bulg.*; *Ross. mer.*; *Pont. Arm.* (*fide* Stgr.).
- var. *polaris*, Stgr., Cat., p. 10 (1861). (minor obscurior sublt. subfasciata). *Lap.*; *Norv. bor.*; *Finmark.*
- var. *uralensis*, Stgr., Cat., p. 10 (1861): (minus ocellata sublt. fasciata, an *polaris* var. vel transitus ad sequentem.) *Ural mer.*; *Orenburg*; *Kirg. steppe* (*Mus. Stgr.*) *Sib. c.* (*Krasnoyarsk*).
17. EPIPSODEA, *Butl.*, Cat. Sat. Brit. Mus., p. 80, t. 2, fig. 9 (1868). *Colorado alp.*, ad 9500 *ped.*; *Montana, Idaho*, 2—7000 *ped.*; *Brit. Columbia.*
- ? var. *brucei*, Elwes (minor, absque ocellis, fascia rufa fere obsoleta). *Summit County Colorado*, 12,000 *ped.*
18. STYGNE, *Ochs.*, i., 1, 276 (1807); H.-S., 90, 91, ♀. *Germ. mer. et Gal. mer. mont.*; *Pyr.*; *Daghestan* (*fide* *Romanoff*).
- pirene*, Hüb., 223, 4 (1800?).

19. NERINE, *Freyer*, 13, 3, 4 (July, 1831); *Germ. mer. or. et Tyrol mont.*
Boisd., Ic., 31, 6, 7 (1832).
reichlini, *H.-S.*, *Corr. Ins. Nr.*, i., p. 5;
Speyer, *S. E. Z.*, 1865, 243.
 var. *stelviana*, *Curo.*, *Bull. Ent. Ital.*, iii., *Ital. bor. alp. (Stelvio).*
 p. 347 (1871): (inconstans, nomen
 haud conservandum?).
 var. *morula*, *Speyer*, *S. E. Z.*, 1865, p. 248 *Tyrol mer.; Alp.*
 (minor obscurior subtus unicolor).
20. SCIPIO, *Boisd.*, Ic., 30, 1—6, i., p. 152 *Gall. alp. mer. or. (Digne).*
 (1832).
21. EPISTYGNE, *Hüb.*, *Verz.*, p. 62 (1816); *Hüb.*, *Gall. mer. or.*
 855—8.
22. MELAS, *Hербst*, 210, 4—7, viii., p. 191 *Hung. mer. mont.; Carn.; Græcia mer. mont.; Dalm. Pyr. or., 7—9000 ped.*
 (1796).
maurus, *Esp.*, 107, 3, 4 (1798?).
 forma *pyrenæa*, *Ober.*, *Ent.*, viii., p. 22;
God., ii., t. xvii., 1, 2, ♂.
 forma *astur*, *Ob.*, l. c., p. 22, t. i., 12, ♀ *Asturias mont., 6—8000 ped.*
 (formæ vix vel haud distinguendæ,
melas proximæ).
 var. *lefebvrei* (? *Boisd.*, *Ind.*, p. 23, 1829); *Pyr. cent., 6—8000 ped.*
Dup., t. xxxv., 3, 4, ♂; ? *H.-S.*,
 88, 9 (forma major ocellata, trausitus ad *hewitsoni*.)
hewitsoni, *Led.*, *Wien. Mon.*, 1864, p. 167, *Georgia; Suanetia; Persia bor. mont.*
 t. 3, 6, 7; *Stgr.*, *Hor. Ent.*, 1870,
 p. 65 (? *lefebvrei* var., vel transitus ad *eviam*).
23. EVIAS, *God.*, *Tabl. Méth.*, p. 21 (1822); *Val. Ped. et Gal. alp.; Pyr.; Hisp. centr.*
Lef. Ann. S. Lin., Paris, 1826, 488
 t. 10.
bonellii, *Hüb.*, 892—5 (1827).
24. GLACIALIS, *Esp.*, 116, 2 (ante 1800?); *H.-S.*, *Helv. et Tyr. alp.*
 173—4.
pluto, *Esp.*, 121, 1.
 var. vel ab. *alccto*, *Hüb.*, 528—9 (1802?),
persephone, *Esp.*, 121, 5, 6 (1805?).
25. MAGDALENA, *Streck.*, *Bull. Brook. Ent. Colorado, 12,000—14,000 ped.*
Soc., iii., p. 35 (1880); *Edw.*, *Butt.*,
N. Am., iii., pt. v.; *Er.*, 1, 1—4 (1888).
26. META, *Stgr.*, *S. E. Z.*, 1886, p. 237. *Namagan mont. (Turkestan).*
gertha, *Stgr.*, l. c. (var. inconstans?; fasc. magis distincta, nomen vix conservandum).

- var. *alexandra*, Stgr., *l. c.*, 1887, p. 55. *Alexander Mnts.*
issyka, Stgr., *l. c.*, nom. vix conservandum; (ocellis majoribus, al. ant. rufescens, transitus ad *mopsos*). (prov. *Samar-*
cand); *Issykkul*
(Turkestan).
 var. *mopsos*, Stgr., *S. E. Z.*, 1886, p. 239. *Prov. Samar-cand*;
 (♀ al. ant. rufescentibus. ♂ et ♀ *Kuldja*.
 punctis indistinctis).
27. LAPPONA, *Esp.*, 108, 3 (1798?). *Alp.*; *Pyr.*; *Scand.*
manto, Fab., *Ent. Syst.*, 231 1793 nom. *mont.*; *Lap.*; *Alt.*;
 præocc.); *Hübner*, t. 45, 107—8.) *Balk.?*
mantoides, Butl., *Cat. Sat.*, p. 87, t. 2, 6.
 ab. *pollux*, *Esp.*, 67, 3 (nom. præocc.)
 var. *sthennygo*, *Grasl.*, *Ann. Soc. Ent. Fr.*, *Pyr. centr.*
 1850, t. 10, 1—3 (inconstans, no-
 men vix conservandum; fasc. ala-
 rum supra et infra obsoletis vel
 indistinctis).
28. OCNUS, *Ev.*, *Bull. Mosc.*, 1843, iii., 538, *Sib. mcr. alp.*; *Ala-*
 t. 8, 5, a, b; *H.-S.*, 291—2. *tau*; *Ural*.
29. SIBO, *Alph.*, *Lep. Kuldja* (ex *Hor. Ent.* *Kuldja alp.*; *Thi-*
Ross., 1881), p. 83, t. xv., 20 ♂, 21 ♀. *anshan*; *Transili-*
thianshanica, Stgr. MSS. *mont*.
tartarica, *Ersch. MSS.*
30. DISCOIDALIS, *Kirby*, *Faun. Bor. Am.*, iv., *Am. bor.* (*Hud.*
 p. 298, t. iii., 2, 3; *Graeser*, *Berl. Ent.* *Bay*; *Brit. Col.*)
Zeit., 1888, p. 96. (Lord); *Asia bor.*,
 70° N. (*Tryb.*);
Amur. sup. (*Grac-*
ser); *Ougan, N.E.*
Asia (Maack).
31. DABANENSIS, *Ersch.*, *Hor. Ent. Ross.*, viii., *Irkutsk.*
 p. 315; *Rom.*, *Mem.*, ii., t. xvi., fig. 1.
32. KALMUKA, *Alph.*, *Lep. Kuldja* (*Hor. Ent.* *Kuldja mont.*
Ross., 1881), p. 81, t. 18 ♂, 19 ♀.
33. RADIANS, *Stgr.*, *S. E. Z.*, 1886, p. 240. *Kuldja mont.*; *prov.*
Ferghana mont.
34. TYNDARUS, *Esp.*, 67, 1 (1781); *cf. Ob.*, *Et.* *Alp.*; *Pyr.*; *It.*;
Ent., viii., p. 25. *Hung. et Gal.*
mont.
callias, *W. H. Edw.*, *Trans. Am. Ent.* *Colorado.*
Soc., iii., p. 274 (1871).
dromus, *H.-S.*, 168—9, 275, vi., p. 8 (var. *Pyr.*; *Cauc.*; *It.*
 inconstans cum trans. ad *tyndarum* *mont.*; *Arm.*
 typicum et ad *hispanicam*; fasciis
 latis rufis, ocellis majoribus).

- var. *hispania* (rect. *hispanica*), Butl., Cat., 86, t. ii., 7 (major, ocellis maximis, subt. unicolor). *And. mont.* (Sierra Nevada).
- var. *ottomana*, H.-S., 376, 379—80, vi., p. 8; Stgr., Hor., 1870, p. 67 (maxima, fascia fere obsoleta, subt. unicolor). *Græciamer. mont.; Bith.; Arm. mont.*
- var. *sibirica*, Stgr., S. E. Z., 1881, p. 270 (? nomen vix conservandum trans. ad *ottomana* et *dromus*). *Tarbagatai.*
35. GORGE, *Esp.*, 119, 4, 5 (ante 1800?); Hüb., 50, 2—5. *Sum. Alp. Pyr.*
- var. *triopes*, Speyer., S. E. Z., 1865, p. 248 (al. ant. ocellis 3 apicalibus). *Sum. Alp. (cum formatyp. mixta).*
- var. *gorgone*, B., Ic., 29, 5—8, i., p. 150; H.-S., 75, 76 (major, ♂ subt. minus variegata, ♀ venis albicantibus, ? transitus ad *goantem*). *Sum. Pyr. cent.*
- var. ? *gigantea*, Ob., Et. Ent., viii., t. i., 7. *Asturias mont.*
36. GOANTE, *Esp.*, 116, 1 (ante 1800?); H.-S., 77, 79. *Alp.*
37. PRONOE, *Esp.*, 54, 1 (1780); Hüb., 215—17. *Alp.; Styr.; Gal. It. et Hung. mont.; Cauc.; Bith. mont.; Arm.; Sib. Alp., etc.; Pyr.*
- var. *pitho*, Hüb., 574—7 (? inconstans, obscurior, fasciis rufis subnullis).
- var. *pyrenaica*, Stgr. (inconstans, non. haud conservandum).
- ? var. (mihi nat. ignota) *melancholica*, H.-S., 276—9, vi., p. 10. *Ararat; Arm. mer. occ.*
38. ETHIOPS, *Esp.*, 25, 1, ♂ (1777), 63, 1, ♀. *Eur. c.; Angl. sept. Liv.; Turc. s. or.;*
medea, Hüb., 220—2. *Cauc.; Alt.*
- var. vel bona sp., *neoridas*, Boisd., Ind., p. 23; Ic., 29, 1—4 (pallidior, ♂ subt. minus fasciata). *Gal. mer. alp. et mont.*
39. ZAPATERI, Ob., Ann. Soc. Esp., iv., p. 370, t. 17, 1, 2 (1875). *Catalonia; Aragon; Albarracin.*
40. SEDA KOVII, *Ev.*, Bull. Mosc., 1847, iii., 70, t. i., 5, 6; H.-S., 591—2. *Sib. or.; Amur sup. et inf.; Japan mont.*
- niphonica*, Jans., Cist. Ent., ii., p. 153, t. v., 5 (1877).
41. LIGEA, *Linn.*, Syst. Nat., x., 473; Hüb., 225—8. *Eur. cent. et sept. mont.; Bulg.; Cauc.; Sib.; Scand. mt.*
- var. *ajanensis*, Men., En., ii., p. 104, 1855. *Amur. inf.*
- cumonia*, Men., Schrenk's Reise, p. 34, t. iii., 4.

- var. (trans. ad *curyale*) *adyte*, Hüb., 759—60 (subt. magis albo-fasciata, supra fasciis luteis); cf. Schilde, S. E. Z., 1873, p. 179. *Lap.; Fen.; Alp., etc.; Scand. sept.*
- var. *jenesciensis*, Trybom, Ofver. Vetensk. Akad. Forh., 1877, p. 46 (? var. constans et distincta; non vidi). *Jenesei flum. 62°—68° N.*
- var. *livonica*, Teich., S. E. Z., 1866, p. 133 (al. post. subt. unicoloribus brunneis). *Liv.; Finland; Tyrol (coll. Zeller).*
- var. *curyale*, Esp., 118, 2, 3; Hüb., 789—90; cf. Meyer-Dür, p. 177. *Alp.; Pyr.; Sib.; Hung. et Gal. mt.; It. cent. mt.; Alt. Alp.; Sib. (Irkutsk)*
- ab. vel var. inconstans *ocellaris*, Stgr., Cat., p. 11 ("supra maculis parvis [non fascia] rufis, nigro-punctatis").
- var. *curyaloides*, Tengstr., Cat., p. 5 (ocellis subnullis). *Fen.; Ross. occ. et bor.*
42. EMBLA, Thunb., Diss. Ent., ii. (Dec., 1791), p. 38, t. f. 8, 8. *Scand. cent. et bor.; Ross. sept.; Sib. bor. ad 70° N.; Amur. sup. et inf.*
43. DISA, Thunb., l. c., p. 37; Freyer, 416, 1, 2. *Lap.; Ross. bor.; Sib. bor. ad 70° N.*
griela, Hüb., 228—9.
- ? var. *mancinus*, Doubl. Hew., Gen. Di. Lep., ii., p. 380; Atlas, t. 54 (1850—52). *Am. bor.; Alaska; Brit. Columbia.*
- ? var. vel bona sp. *rossi*, Curt., App. Ross. Voy., p. 67, t. A, 7 (1835). *Am. arct. 67°—68° N., Boothia felix.*
 Aurivillius Ins. Vega Exp., iv., p. 75, t. 1, 4, 1885 (minor obscurior minus ocellata). *St. Lawrence Bay, N.E. Asia.*
44. FASCIATA, Butl., Cat. Sat. B. M., p. 92, t. 2, 8 (1868). *Am. arct. (Winter Cove, Cambridge Bay, exp. Collinson).*
 var. ? minor minus fasciata. *Hudson Bay, fide Strecker ex Geffcken.*
45. CYCLOPIUS, Ev., Bull. Mosc., 1844, iii., 590, t. 14, 3, a, b; H.-S., 607—8. *Sib. cent. et or.; Am. sup. et inf.; Ural.*
 var. *intermedia*, Trybom, Ofver. Vetensk. Akad. Förh., 1877, p. 46 ("al. post. subt. puncto medio ac tribus submarginalibus albis"); forma intermedia an *tristis* referenda? *Jenesei, 65° N.*
46. AFRA (*afer*), Esp., 83. 4. 5 (1783). *Ross. mcr.; Sib; Tarbagatai.*

- var. ? *dalmata*, God., Enc. Meth., p. 530
(major, sub*tus* magis unicolor, ? in-
constans).
47. PARMENIO, *Boeb.*, Nouv. Mem. Mosc., ii.,
p. 306, t. 19; H.-S., 421—2, 464—6.
var. (vel. ab. ?) *inozellata*, Graes., Berl.
Ent. Zeit., 1888, p. 96.
48. TRISTIS, *Brem.*, Bull. Acad., 1861, t. iii.
wanga, *Brem.*, Lep. Ost.-Sib., p. 20, t. ii., 1.
49. ERO, *Brem.*, l. c., p. 20, t. ii., 2; Trybom,
l. c., p. 48 (? bona sp. vel var. *disa*
affinis; al. post. sub*t.* punctis albis dis-
tinguenda).
50. EDDA, *Men.*, Midd. Reise, p. 58, t. iii.,
11 (1851): Graeser, Berl. Ent. Zeit.,
1888, p. 96.

Dalmatia; *Aska-
bad*, *N. Pers.* (fide
Christoph.).

Sib. cent.; *Amur.
sup.*

Amur. sup. (*Poch-
rofska*).

Amur.

Amur.; *Yenesci*,
78° N. (*Trybom*).

Amur. sup. et inf.

Species incerti sedis; transitus ad genus *Callerebia*:—

51. MYOPS, *Stgr.*, S. E. Z., 1881, p. 296.
var. *tekkensis*, *Stgr.*, S. E. Z., 1886, p.
241.
? *maracandica* (apud *Christoph.*, *Rom.*,
Mem., i., p. 105).
? bona sp. vel trans ad *maracandica*.
52. MARACANDICA, *Ersch.*, Lep. Turk., p. 17,
t. i., 13 (1874).
53. KALINDA, *Moore*, P. Z. S., 1865, p. 301, t.
xxx., 5, ♀; Marsh. & de Nicé., *Butt.*
Ind., p. 241.
54. SHALLADA, *Lang*, J. As. Soc. Beng., xlix.,
pt. ii., p. 247 (1880); Marsh. & de Nicé.,
Butt. Ind., p. 241, t. xv., 42, ♂.
55. MANI, *de Nicé.*, J. As. Soc. Beng., xlix.,
pt. ii., p. 247 (1880); Marsh. & de Nicé.,
Butt. Ind., i., p. 242, t. xv., 43, ♂.
var. *jordana*, *Stgr.*, Berl. Ent. Zeit., 1882,
p. 171 (major, fascia lutea al. ant.
minus extensa).
var. ? *roxane*, *Grum-Grsh.* *Rom. Mem.*,
iii., p. 401, 1888 (an bona sp. al.
post. supra distincte rufo-fasciata,
sub*tus* punctis albis subnullis).
56. HADES, *Stgr.*, Berl. Ent. Zeit., 1882, p. 172.

Alatau mont.

Kizil Arvat, *N.*
Persia.

Alai mer.; *Pamir*;
Karategin.

Him. occ. 9—13,000
ped. alt.

Him. occ. 6—8000
ped. alt.

Ladak.

Namagan; *Kho-
kand mont.*

Pamir.

Alai mont.

57. SAXICOLA, *Ob.*, *Et. Ent.*, ii., p. 32, t. iv., *Ourato* (Mongolia).
i. (1876).

EREBIA PATAGONICA, *Mabille*, *Bull. Soc. Patagonia*.
Phil., 1885 (7), ix., p. 55 (non vidi, an
hujus generis?).

I will now give some short notes on the various species, to explain the synopsis; as it must be observed that many of these conclusions are doubtful, and cannot be looked upon as settled until more complete information is obtained about the species.

E. epiphron.—After examining a very large number of specimens, I can only say that though the form *cassiope*, which represents the species in the Alps, is very different in typical examples from *epiphron* of the Hartz Mountains and Silesia, yet it is so variable that in the Pyrenees especially, and also in Scotland, it cannot be looked on as constant. The varieties *rogesiaca* and *pyrenaica* connect it with *epiphron*, and the form *nelamus* is an extreme variety or aberration in which the ocelli have almost or entirely disappeared. In the Balkans and Carpathians, from whence however I have seen but few specimens, the type is rather that of *epiphron* than *cassiope*.

E. kefersteini I only know from Eversmann's description and Herrich-Schäffer's figure, which shows no characters by which it may be distinguished; and it may turn out that *tundra*, which Staudinger says comes between *cassiope* and *melampus*, is the same, though the band on the under side of the hind wing, which is clearly shown in the figure, seems to distinguish it clearly, and to indicate some affinity with *lappona*. *Tundra* has only been found near Lake Baikal, where a form of *melampus* is also said by Staudinger to exist.

E. melampus is a small species, which extends to the Carpathians and Riesengebirge; the var. *sudetica*, from the latter range, does not seem sufficiently well marked to bear a separate name, though typical specimens from Silesia can be recognized.

E. eriphyle remains, after all that has been written by Meyer Dur, Christ, Rothenbach and others, a somewhat doubtful species. All those who have seen it alive, however, consider it to be a distinct one, and though the characters are difficult to describe, and seem somewhat liable to vary, there is no difficulty in recognizing what

are called typical specimens, and there may be occasional hybrids between *melampus* and *pharte*, which are taken for it. Christ says it is nearest to *pyrrhula*, which is a somewhat local high alpine form of *manto*. *E. eriphyle*, though extending from Central Switzerland to Carinthia, seems much more local than any other alpine *Erebia*, and it is to be hoped that now it is better known, further observations will be made on it.

Of *arete*, *mnestra*, and *pharte* little need be said, as they are species little subject to variation and of limited distribution.

E. maurisius, *pawlowskyi*, *haberhauseri* and *kindermannii*, form, with *theano*, a group apart, distinguished by the pale colour of the cell of the fore wing. The name *maurisius* was given a century ago, by Esper, to a species from Siberia which has never been certainly identified.

E. pawlowskyi is also unknown except by description, and *haberhauseri* is almost certainly a mountain form of it. *E. kindermannii* is described from a pair in Lederer's collection from the Altai, and the description agrees well with specimens I received from Herr Tancré from the same mountains, which have, however, been since identified by Staudinger with *maurisius*. I am inclined to think that these four names represent one species, though I do not know it well enough to say so with certainty. *E. sofia* is described by Strecker as being on the upper side an almost exact counterpart of *kefersteinii* (probably he meant *haberhauseri*, which was sent out by mistake under this name).

E. manto is a variable species in which the female differs more from the male on the under side than any other. In the commoner alpine form it is marked above with a distinct band of rufous spots containing ocelli, and the female has a distinct yellowish or sometimes whitish band at the base of the hind wings below, as well as an outer band of the same colour; but in the form called *cæcilia* these bands in the males are quite obsolete, and the colour is a very dark unspotted brown. I cannot, however, see that the form called *vogesiaca* by Christ, of which I have specimens from himself, is at all different from those which I have taken at Kandersteg in Switzerland, and which I at first took for a variety of *pharte*. There is also a small form called *pyrrhula*, Frey, which is referred to *manto* and considered by him to be a high

alpine form of it. This seems rare and local in Switzerland. Meyer-Dur considered *cæcilia* to be a form of *glacialis*, but in this I cannot agree with him, as I have taken it both in the Alps and Pyrenees in localities quite unlike, and widely separated from, the stony slopes which *glacialis* inhabits.

E. ceto and *cæme* are both distinct species. Gumpfenberg says that the var. *hippomedusa* connects *ceto* with *medusa*, and var. *spodia* connects *ceto* with *cæme*; but I have seen no specimens of either that I should consider doubtful, though the variation in the ocelli is very great in both these species.

E. medusa.—This is a very wide-ranging species, which extends from Germany to the Upper Amur and the North of Scandinavia. It is supposed by Strecker, who quotes Staudinger in support of his opinion, to be inseparable from *epipsodea*, Butl., a species which inhabits the Rocky Mountains and extends north to British Columbia. I have no specimens of *medusa* from Siberia for comparison, but all my European specimens may be easily distinguished from the American species by the absence of the band on the hind wings below; this band is more or less present in the vars. *uralensis*, Stgr., and *polaris*, Stgr., and it may be that specimens of these forms occur which connect *medusa* with *epipsodea*, though I have not seen them.

Von Gumpfenberg separates *polaris* specifically from *medusa* on account of the difference in the hind wings below, and makes *uralensis* a variety of it, placing them next to *epipsodea*; but I am not at present able to concur in this opinion.

I have a single specimen and Mr. Godman has a similar one collected by Bruce in Cashier Valley, Summit County, Colorado, at 12,000 feet, which are considered by Bruce and W. H. Edwards to be a variety of *epipsodea*, though it is so different from it that had I more specimens I should be inclined to consider it as a different species, more especially as *epipsodea* does not appear to extend to such great elevations or to vary much; though its range of altitude is very great. I have taken it in Idaho at about 2000 feet elevation, and in the Yellowstone Park at 5—6000 feet, and have it from Colorado, taken by Bruce as high as 9500 feet.

The specimens above mentioned are somewhat smaller

and with rounder wings than the average of *epipsodea*, but are best marked by the entire absence of ocelli on either wing or on either surface and the partial disappearance of the red band. Though I do not attach great importance to ocelli in the *Erebias* as a specific character, yet these specimens are certainly a well-marked variety, and among thirty specimens of *medusa* and sixteen of *epipsodea* I have none in which the ocelli on either fore or hind wing are wanting.

E. psodea, Hübn., which by Staudinger is treated as a form of *medusa*, confined to South-eastern Europe, but which is recorded also from Monte Baldo, in Italy, is separated specifically by Von Gumpfenberg, but the characters which he relies on are not visible in my specimens from Eperies, in North Hungary.

E. stygne.—This species, though it has not a very wide range, is extremely variable, but none of its varieties seem sufficiently fixed to have received names. It is extremely abundant in the Pyrenees, where some of the females have a pale band, almost white, on the under side of the hind wings; and both sexes have the bands and ocelli wider and more conspicuous than is usual in the Alps, where both are sometimes almost, if not quite, obsolete. Some Pyrenean specimens come so close to *erias*, which occurs with it, but has a rather higher range, that I can hardly distinguish them except by the under side of the hind wing; and others are somewhat like some specimens of *nerine*, which apparently represents it in the Eastern Alps.

E. erias, in Switzerland, occurs in the hot parts of the Valais, at a low elevation, and flies early in the season; in the Pyrenees it ascends to 6000 or 7000 feet, and is found also in the mountains of Central and Eastern Spain.

E. melas is a species which varies extremely, and may perhaps be separated into two or three forms, of which the typical *melas* is found in the Pyrenees, and in South-eastern Europe from Carniola to the Carpathians and Greece.

The variety *lefebvrei*, Boisd., with much larger ocelli, and in some specimens, especially the females, with a broad band on the fore wings, occurs in the Central Pyrenees, and again, as *hewitsoni*, in Armenia, Georgia, and Suanetia. This last is separated specifically by Von Gumpfenberg, and seems to me as near to *erias* as to *melas*; but strange to say, neither form is found in the

Alps or in the mountains of Asia Minor, and the Central Pyrenean and Armenian forms resemble each other as much as those of the Central and Eastern Pyrenees. A more remarkable case of interrupted distribution without apparent cause, and of similar variation in the extreme points of the range, is hardly to be found in any other species. It occurs also in the mountains of Asturias (var *astur*, Ob.) and in Central Spain. The only female from Greece which I have examined has the under side of the hind wing mottled in a different way to any of the females of either Pyrenean form.

E. meta and its var. *gertha*, Stgr., from Oseh and Namagan, in Eastern Turkestan, are not nearly allied to any European species, though they seem to me too close to *E. mopsos*, Stgr., which comes from the same mountains. Staudinger, however, after comparing large numbers of both, thinks them distinct. *Alexandra* is another form from the same region, which Staudinger places as a form of *mopsos*, but Von Gumpfenberg calls a synonym of *meta*. I expect all these four will have to be united as one species eventually, though my materials are not sufficient to enable me to do so with certainty at present.

E. turanica, Ersch., and var. *læta*, Stgr.—A very distinct species, which Staudinger places between *pharte* and *thcano*, is found in the Alatau, Namagan, Kuldja, and other parts of North-Eastern Turkestan, and has no near allies either in Europe or Asia as far as we know yet. The series of white spots, sometimes coalescing into a band on the under side of the hind wing, distinguish it at a glance.

E. glacialis is a very distinct species of the high alps, which is almost entirely without ocelli, though aberrations rarely occur in which they are present. It has no near allies in Europe or Asia, but in the highest peaks of Colorado, frequenting the same stony rocky slopes as *glacialis*, is found a species which considerably resembles it, namely, *E. magdalena*, Streck. An excellent account of this rare species, of which I have lately received specimens from Mr. Bruce, is given, with figures, in a recent part of Edwards' 'Butterflies of North America'; and I may here note that *E. haydeni*, which he figures with it, and of which I have both sexes from the Yellowstone Park, is, I believe, a *Cænonympha* and not an *Erebia*.

E. scipio, Boisd., and *epistygne*, Hüb., are two species

confined in their range to the mountains of Southern and South-eastern France. The former seems most nearly allied to *nerine*, the latter to *erias*, but both are well-marked species, and seem to be subject to little variation.

E. afra, Esp., and *dalmata*, God., are by Von Gumpenberg considered distinct from each other, but Staudinger places *dalmata* as a variety of *afra*, and the specimens I have seen from the Mützell collection differ only in their rather larger size and less distinct marking below. It must be either very local or very rare, as so good a collector as Josef Mann never got it in three summers which he spent in Dalmatia, but it is said to occur at Sebenico and Obrova in that country. Christoph also notes its occurrence in the mountains near Askabad, in North Persia, and treats it as a var. of *afra*; *afra*, however, is a very distinct species from any other, and is found in South-eastern Russia, as well as in Turkestan and North Persia. Its nearest ally seems to be

E. parmenio, Boeb.—A large and distinct species, which is found in Eastern Siberia as far south as Kiachta and on the Upper Amur region. It seems, like *afra*, to be an inhabitant of lowland and not of alpine districts. A form of it without ocelli is described by Graeser as *inocellata*.

E. lappona is one of the most distinct and commonest species in the high Alps, Pyrenees, and Scandinavia, and occurs also in the Altai, but not in any intermediate mountain ranges, or in Arctic America or Asia. This is a curious instance of sporadic distribution with general but no marked local variation, for the two named forms of this, *pollux*, Esp., and *sthennygo*, Grasl., are hardly worthy of separation. Though the latter seems to be the typical form in the Central Pyrenees and not to occur elsewhere, it is not as yet a fixed variety, as ordinary specimens of *lappona* are found with it. I have also a specimen of *lappona* labelled "Balkan," but I do not know on whose authority, and can find no published record of its occurrence there.

E. dabanensis is a species described by Erschoff from a single specimen in his collection taken near Irkutsk. From the figure it seems nearest to *lappona*, but with ocelli on the hind wings, and may be a form of it or a distinct species.

E. discoidalis, Kirby, is a very peculiar species, which extends from Pochrofka on the Upper Amur to the banks of the Yenesei River, in lat. 70° N., and also occurs on the western shores of Hudson Bay, from whence I have specimens. It will probably be found in other parts of North-eastern Asia and North-western America, but I have not had the opportunity of comparing Asiatic with American specimens. Though placed by Staudinger, who perhaps had never seen it, after *disa*, it seems to me most nearly allied to *ocnus*.

Next we have a group of so-called species from the high mountains of Turkestan, namely, *ocnus*, Ev., *tartarica*, Ersch., *sibo*, Alph., *thianshanica* (? Staud. MSS.).

Of these I have *ocnus*, from the Alatau and Tarbagatai, which I cannot agree with Von Gumpfenberg in treating as a var. of *lappona*, and what were sent as *thianshanica*, from Kuldja and Transili, by Staudinger, which differ in their greater size and the absence of the reddish brown on the fore wings, which is distinct in *ocnus*.

This *thianshanica* is exactly represented by Alpheraky's plate of *sibo* male, whilst his figure of *sibo* female, which is much smaller and more distinctly banded below, represents exactly what I received as *tartarica* from Erschoff (but of which I can find no published description), and in both sexes as *sibo* from Alpheraky himself.

It seems from this rather scanty material that *ocnus* is a good species distinct from *lappona*, and that *sibo*, *tartarica*, and *thianshanica* are another, which is variable both in size and in the colour of the under side, and that both of them should be placed, as Staudinger has done, in close proximity to *lappona*.

Near to *ocnus*, but well distinguished by the shape of the wings, in the male especially, and probably belonging to a different group, we have *E. radians*, Stgr., with var. *usgutensis*, from Osch and the South-eastern Altai; and *E. kalmuka*, Alph., from the Kuldja district. Both of these seem quite distinct, especially the latter, which has the costa and margins of both wings of a silvery grey colour, quite unique in the genus.

E. tyndarus.—This species has the widest range of any non-arctic species, and occurs abundantly in the Alps, Pyrenees, Spain, Greece, Caucasus, Central Asia, and in the mountains of Colorado. It has been divided by

Von Gumpenberg into three species, namely, *tyndarus*, of which he makes *callias*, Edw., the Colorado form, a variety; *dromus*, H.-S., of which he makes *hispanica*, Butl., a variety; and *ottomana*, H.-S. Staudinger makes both *dromus*, *ottomana*, *hispanica*, and *sibirica* simple varieties of *tyndarus*. My own collection of this species is very rich, comprising 30 specimens selected out of hundreds from the Alps, 30 from the Pyrenees, 18 from the Sierra Nevada of Spain, 3 from the mountains of Asturias, 4 from Greece and Asia Minor, 5 from the Caucasus, 1 from Siberia, and 12 from Colorado. After a careful study of them I am unable to separate any except *ottomana*, as a variety, which is sufficiently fixed and invariable to be constantly recognised; though *hispanica* is easily distinguishable from the alpine form, and only connected with it through the very variable forms of *dromus* which occur in the Pyrenees. I can give no opinion as to the variety *sibirica* from Tarbagatai, which Staudinger says forms a transition to *ottomana*, and if this is so, it may be that even *ottomana* is not capable of exact definition, though it is certainly very unlike the typical *tyndarus*, and would, without the intermediate forms, be considered abundantly distinct. As to *callias*, I feel confident that it is at best but a variety, the only character by which I can recognise it being that the reddish patch on the fore wing below is extended inwards parallel to the costa in a manner which is only occasionally seen in other forms; though this character is found in some specimens from Asturias, Greece, the Caucasus, and Siberia. Von Gumpenberg gives as a character, "Alis post. subtus nigro-punctatis," but this is not constant in Colorado specimens, or always absent in European ones.

E. gorge is another very variable species confined to the Alps and Pyrenees, in both of which it frequents only high elevations. Von Gumpenberg separates *triopes* as a species on account of the supposed difference in its habitat and habits, but I have taken both flying together both in the Engadine and on the Albula Pass. As to the variety *gorgone* from the Pyrenees, I must repeat what I said in these 'Transactions,' 1887, p. 398, viz., that though typical *gorgone* seems fairly distinct, yet it seems to be connected with *gorge*, also found in the Pyrenees, by intermediate forms.

The next group consists of five or perhaps six species, all nearly allied to each other.

Of these *pronoe* and *æthiops* are the best known and most widely distributed, the former extending from the Pyrenees to Eastern Armenia, the latter from England to Eastern Siberia. Both of them vary considerably.

E. neoridas, Boisd., which Staudinger treats as a distinct species, Von Gumpfenberg makes a variety of *æthiops*, and perhaps he is right in this; but *sedakovi*, Ev., from the Amur and Japan, which he treats in the same manner, is, I think, constantly separable, though I have no Siberian specimens of *æthiops* for comparison with it, and intermediate forms may occur. Neither Ménétries, Bremer, or Graeser seem to have found *æthiops* in Amurland, and I do not know Staudinger's authority for its occurrence there.

E. zapateri is a species which seems quite distinct, and is confined to the mountains of Aragon and Catalonia in Spain.

E. melancholica, H.-S., is unknown except from the figure, and has been found by no recent traveller. Staudinger thinks it may be a var. of *neoridas* or rather *æthiops*, and the figure given by Herrich-Schäffer might well represent a form of *pronoe* which occurs in the same region.

E. sedakovi is the eastern representative of *æthiops*, to which it is nearly allied, and is not distinguishable from the Japanese form which has been called *niphonica*; it extends to the Upper Amur region, and may be found farther west.

The next species on the list is *E. ligea*, a very wide-ranging and variable species, which occurs in almost all parts of Central and Northern Europe and Asia. *Euryale* is by many considered a distinct species, and in the Alps seems to be so, and found at a higher elevation than *ligea*; but intermediate forms occur in Northern Europe under the name of *adyte* which seem to make an exact definition of the two species impossible; and both Lederer, Herrich-Schäffer, and Schilde have held the same opinion as I do. In Asia it takes other forms, of which *ajanensis*, occurring in the Amur region, is one, and *jeneseiensis* another. I have not seen any typical *euryale* from Asia, though it is reported to occur in the Altai Mountains.

E. embla, *E. disa*, and *E. fasciata* are boreal forms of wide range, and though nearly allied and variable in size and ocelli, are distinguished by constant characters, so far as I have seen. *E. rossi* may be distinct, but it is so rare that I cannot say so, and the only specimens I have seen look like an arctic variety of *disa*, to which also *mancinus* seems to belong.

E. cyclopius and *tristis* are excluded from the genus *Erebia* by Von Gumpenberg, who says they are nearer to *Satyrus dryas* and *actea*, but I do not see any reason for separating them myself.

E. ero and *edda* are two little-known species from Eastern Siberia, of which I know too little to speak with certainty. They are both distinguished by white spots on the under side of the hind wings. *E. ero*, from the figure, might be perhaps a form of *disa*, but I have never seen a specimen.

We have now a small number of eastern species which appear to form a transition to the genus *Callerebia*, Butl., which represents the genus in the Himalayas and China. They are principally distinguished by the different shape of the hind wings, but I have not been able to detect any structural characters upon which a subgenus could be defined, and they are not very nearly allied among themselves.

E. myops is a very distinct species, which differs in the colour of the hind wings below from any other; it seems to occur both in the mountains and in the steppe or low hills which border it in North Persia.

E. maracandica, *E. kalinda*, and *E. shallada* form a group which, from the material at present existing, seem distinct species, but *maracandica* and *kalinda* may be connected by other varieties which probably occur in the region of the Pamir.

E. mani is another inhabitant of the highest regions of Central Asia, and is inseparable, I believe, from the form named *jordana* by Staudinger; but *roxane*, of which I have only seen three specimens, though closely allied, has a red patch on the hind wings, which may indicate a distinct species or variety.

E. hades is another fine species, which might perhaps be placed near *tristis*.

Whether *saxicola* is a good species or not I cannot

say. It may be a *Callerebia*, but all these newly-discovered Central Asiatic species are at present so rare that their classification must be deferred till we know them better.

E. patagonica, Mabille, is unknown to me, and may belong to another genus, but if not, it will be the only species in South America, as *E. vesagus*, Doubl., and *E. boisduvalii*, Blanch., from Chili, are not *Erebias*, but belong to the genus *Neosatyrus*, Wallengren.